



ATOME

GREEN HYDROGEN & AMMONIA PRODUCTION FOR THE WORLD

FEBRUARY 2023



UK HFCa



www.atomeplc.com

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The logo for ATOME, consisting of the word "ATOME" in white, uppercase, sans-serif font, centered within a dark teal rectangular background.

GREEN HYDROGEN & AMMONIA

ATOME WILL BE THE LARGEST UK BASED GREEN HYDROGEN AND AMMONIA PRODUCER BY 2025

The only London Stock Exchange company focused on the production & sale of green hydrogen and ammonia

EARLY MOVERS AT SCALE

120MW

Baseload Power Purchase Agreement for initial project in Paraguay

FIRST TO MARKET

Front-End Engineering and Design on track for completion in Q2 2023

100% RENEWABLE

Largest announced project in Latin America by 2025, powered by hydro

100,000

tonnes of potential green ammonia per year in 2026*

WORLD-SCALE

Current pipeline of over 621MW of projects globally

OUR BUSINESS



Fast-track

Targeting locations where infrastructure and readily available low-cost power are available



Ammonia In Agriculture

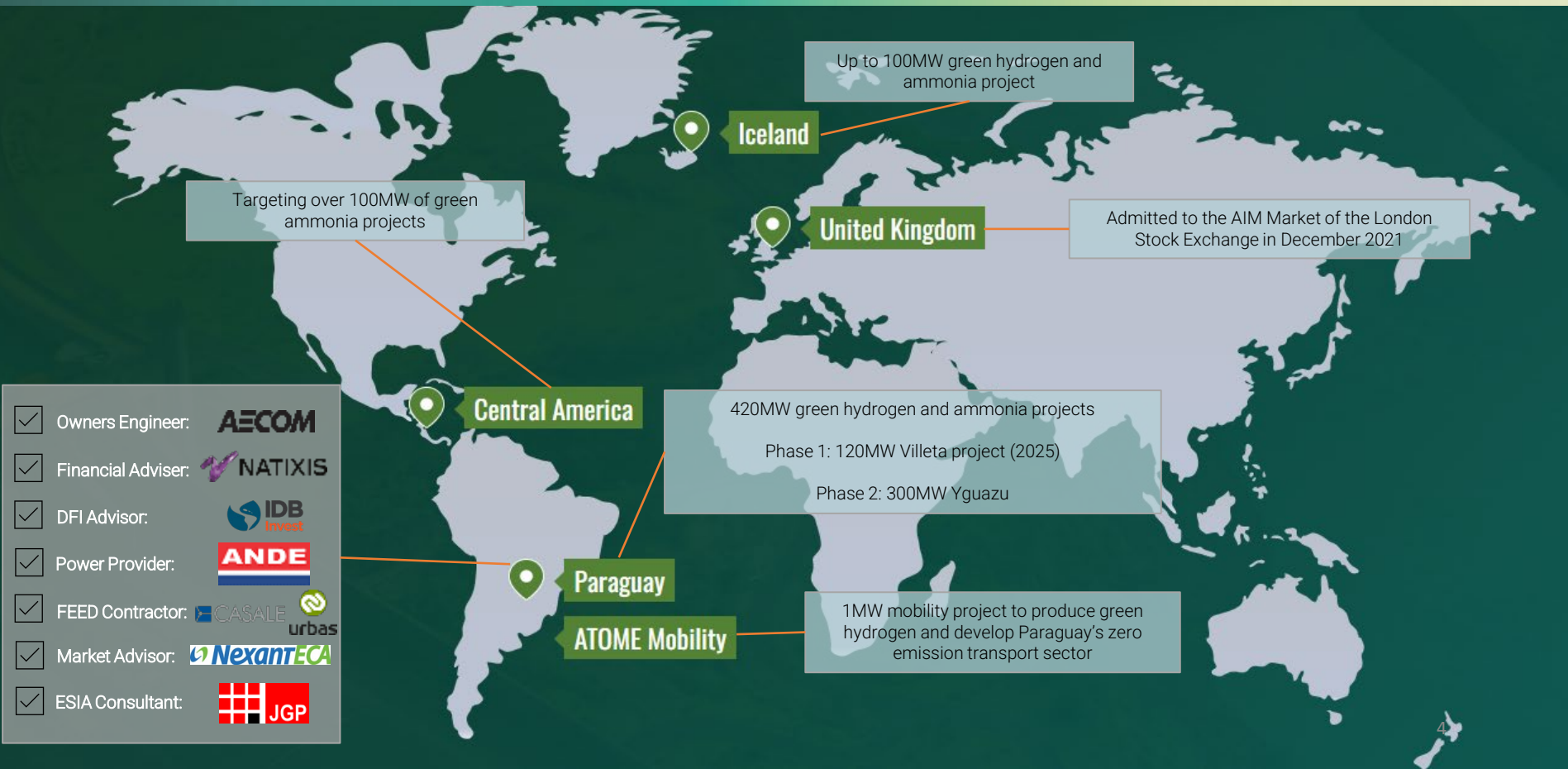
Delivering green ammonia to existing markets displacing imported fossil fuel based fertilisers



Clean Fuel

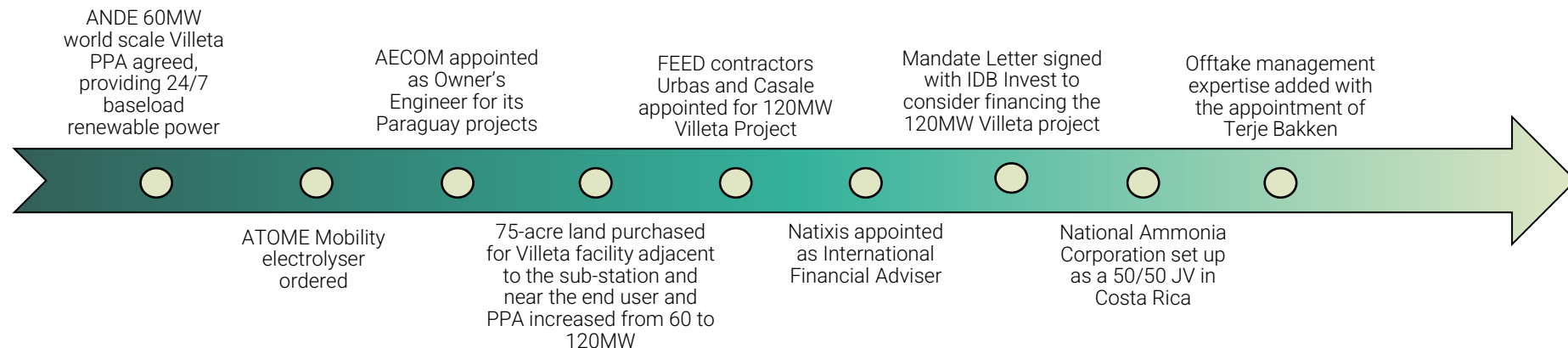
Providing a clean energy solution for heavy road transport and shipping

ATOME | Growing our existing pipeline, globally



ATOME | Progress Since IPO

Material progress on its existing projects, increased total target pipeline by nearly 150% to 620MW+



Continued progress to be done:

- ✓ Mobility: first green hydrogen production in H2 2023 with first hydrogen vehicles in Paraguay running by the end of the year
- ✓ Further Phase 2 300MW renewable baseload 24/7 PPA in Paraguay in final stages of negotiation
- ✓ Villeta FEED completion in Q2 2023
- ✓ Final Investment Decision for Villeta project expected shortly after FEED
- ✓ Project outline to be determined and agreed for National Ammonia Corporation
- ✓ Power supply to be agreed for Iceland project

| PIPELINE | |
|-------------------|---------|
| Paraguay Projects | 421MW |
| ATOME Mobility | 1MW |
| Villeta | 120MW |
| Yguazu | 300MW |
| Central America | 100MW + |
| Iceland Project | 100MW |
| TOTAL | 621MW |

ATOME | Expert, Experienced Management



Peter Levine
Chairman

Peter MA (Oxon) is the Chairman and largest shareholder of ATOME. As the executive Chairman, founder and single largest shareholder of the then FTSE 250 Imperial Energy, he oversaw the growth from 25p at flotation to 1250p until its \$2.4 billion sale in January 2009

Between 1993-2008, Peter Levine was Deputy Chairman and then Chairman of the then FTSE 250 listed steel construction company, Severfield-Rowen (now Severfield), and was also Chairman of Keltbray group



Olivier Mussat
Director and CEO

Olivier BA, MS, has joined ATOME from being the Chief Investment Officer of Global Energy at the IFC, part of the World Bank Group

After starting his career as a field engineer in the power sector, he is vastly experienced in funding and managing energy infrastructure assets for Oil & Gas, Power & Renewables.

He has lead over \$500M of equity investments in early stage companies and over \$30bn of corporate and structured debt finance transactions



James Spalding
Director and President of
ATOME Paraguay

James BA, MA, was the Paraguayan General Director of the jointly owned Paraguay-Brazil hydroelectric dam Itaipu Binacional between 2013-2018, the second largest hydroelectric dam in the world

Prior to that he was for six years the Ambassador of Paraguay in the US, serving in 2009 as Dean of the Latin American Ambassadors Group (GRULA). He has also served as Paraguay Minister of Finance and as the Governor of Paraguay to the IDB and World Bank group



**Mary-Rose de
Valladares**
Independent Non-Executive
Director

Mary-Rose MA, MBA, was the long-standing General Manager of IEA Hydrogen. With expertise in renewables and hydrogen, she was formerly at the U.S. DOE National Renewable Energy Laboratory (NREL) serving as the renewable and energy efficiency developer at the Centennial Olympics in Atlanta, GA, USA,

She served on the National Hydrogen Association Board of Directors and founded New Mexico Solar Energy Industry Association



Terje Bakken
Director for Ammonia and
Fertiliser Markets

Terje graduated with an MBA from School of Management, Bath University. He started his fertiliser career with Norsk Hydro and Yara International in Oslo. He was then Senior Vice President at Yara International's Executive Management Team for 8 years

Terje started to work with EuroChem in 2013 as a member of EuroChem's management board, responsible for global marketing and sales operations



Itaipu Dam, Paraguay

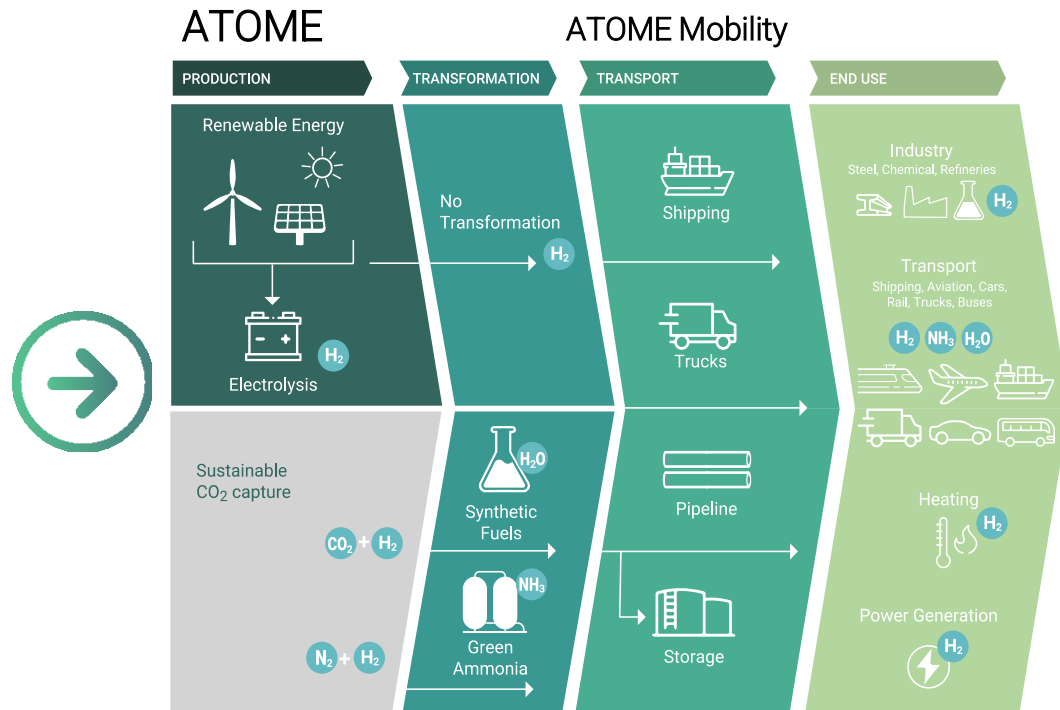
ATOME

GREEN HYDROGEN & AMMONIA PRODUCTION

**ENERGY AND FOOD SECURITY
FOR THE FUTURE**

HYDROGEN | The Right Time. Now More Than Ever

- Today, over 95% of hydrogen is made from fossil fuels
- Low carbon hydrogen could supply up to 25% of the world's energy by 2050 – equivalent to over 20mm bbl of oil taken out of the market every single day. By 2050, the world is forecast to be using 450 million tonnes of green hydrogen. [1]
- As of November 2022, the low-carbon or clean hydrogen sector was expected to generate \$2.5 trillion in revenues by 2030, creating 30 million jobs
- US IRA - \$370 billion in climate and clean energy investments could help cut U.S. GHG emissions up to 43% below 2005 levels by 2030
- Goldman Sachs Global Investment Research about green hydrogen estimates that \$5 trillion of investment is needed in the clean hydrogen supply chain to achieve net zero [3]





THE AMMONIA OPPORTUNITY

THE NEED FOR GREEN

Today, approximately 95% of all production is fossil fuel based [1]

Second-most produced chemical globally, with an annual production volume of over 180 million tonnes each year

80% of global ammonia production is used in fertiliser and 20% for industrial products

Easier to store and transport than hydrogen, an existing and tradeable commodity

Ammonia could become a US\$12 trillion market, according to some estimates [1]

Green ammonia market is expected to grow at a rate of around 85% between 2023 and 2032 [2]

ENERGY CRISIS

Prices of ammonia, natural gas and carbon have significantly increased since ATOME listed in December 2021

RECORD PRICES

Nitrogen fertiliser ammonia hit highs of over US\$1600/MT in 2022, an all-time record. Since then, ammonia prices remained near US\$1,000

FOOD INSECURITY

Europe lost half of its ammonia capacity and 33% of its nitrogen fertiliser operations. Further supply chain risk as Russian and Ukraine globally export 28% of all nitrogen and phosphorous fertilisers

SOLUTION TODAY

ATOME's products currently more economical than fossil fuel-based fertilisers, fast tracking 100k tonnes of green ammonia per year to the global fertiliser industry starting in 2025



Itaipu Dam, Paraguay

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GREEN HYDROGEN & AMMONIA PRODUCTION

PARAGUAY | 421MW PROJECTS

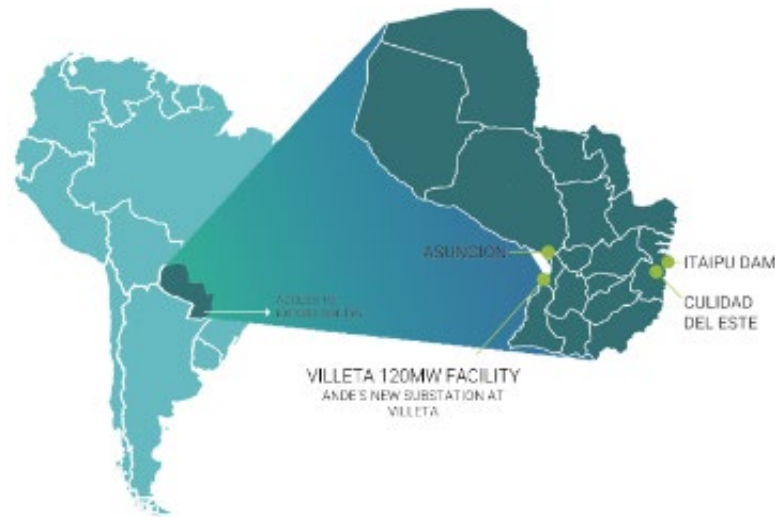
PARAGUAY | The Opportunity

COUNTRY PROFILE

- BB+ Fitch rating, a stable open economy. Low tax and trade barriers
- In 2020, Paraguay exported US\$2.1 billion in Soybeans, making it the 4th largest exporter of soybeans. Agriculture retains 20% of the country's total employment
- Landlocked country heavily dependent on land and river transport for the import/export of goods
- Founding member of Mercosur bloc enjoying free trade and travel with Brazil, Argentina and Uruguay
- Paraguay is powered 99% by renewable energy, primarily from the Itaipu Dam, making it one of the largest exporters of electricity in the world. Paraguay exported roughly US\$1.44 billion worth of electricity to Brazil in 2020

PARAGUAY | KEY FACTS

| | |
|--|--|
| Corporate Tax Rate | 10% |
| GDP | 4.5% growth in 2021 (Fitch, 2021) |
| Energy Policy | Reduce dependency on hydrocarbons and capitalise on hydroelectric capabilities |
| Fertiliser Consumption | 396.37 kg/ha (twice the global average in 2017) |
| Fertiliser Import | US\$601 million (2021) |
| Annual Transport Sector Growth (2012-19) | Cars (11.6%), buses (4.6%) and trucks (6.6%) |



TARGET MARKET

- Targeting domestic offtake markets for hydrogen and ammonia products for the agriculture industry. As of 2020, ammonium nitrate import in Brazil was 1.15 million tonnes that accounts for 13.71% of the world's ammonium nitrate import. Brazil imports 85% of its fertiliser needs
- Transport sector - reliance on HGVs and the world's third largest fleet of barges to transport industrial production - both need to be decarbonised. MOUs signed with the Paraguay aviation authority and the Paraguay barge association

LATIN AMERICA'S LARGEST GREEN AMMONIA FACILITY BY 2025



PPA signed with ANDE, the national power company of Paraguay for 120MW providing 100% green power from the Itaipu Dam



75 acres of land now purchased with available access to water and adjacent to the Villeta substation and in close proximity to industrial clusters and port facilities on the country's primary import/export route



Operational within 3 years and capable of producing up to 100,000MT/yr of green ammonia by end 2025



Appointed Urbas Energy Ingeser-TSK and Casale as the FEED contractor for 120MW Villeta Project with a view to FEED completion and Final Investment Decision



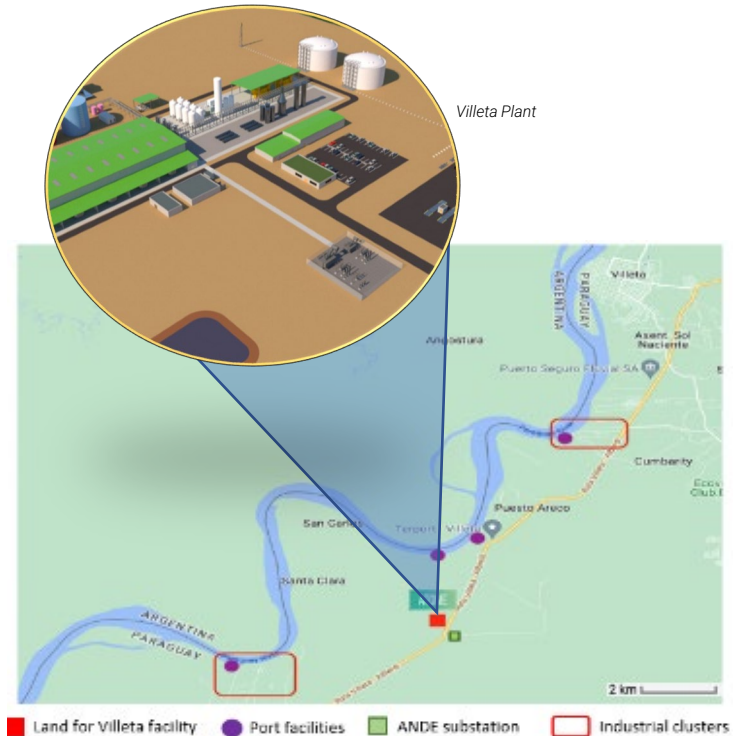
Natixis appointed as International Financial Adviser to structure and secure financing for the project and signed a Mandate Letter with the Inter-American Development Bank



MOU signed with Puma Energy Paraguay S.A. in relation to hydrogen in Paraguay

NEXT STEPS

- Completion of FEED study and Environmental Social Impact Assessment (ESIA)
- FEED Completion and Final Investment Decision 2023
- Appointment of EPC contractor with main sub-packages to be identified and to be tendered. Construction to begin in H2 2023
- Firm interest already shown from offtakers in all of ATOME's prospective Paraguay production



PHASE TWO YGUAZU – 300MW



ATOME is upscaling its original Phase 2 projection from 250 to 300MW making a total of over 420MW for both phases in Paraguay



Targeting Phase 2 commencement of production for 2027 assuming PPA agreed by end 2023

NEXT STEPS

- Additional PPA in Paraguay – already in discussions with ANDE for 300MW
- Select site in close proximity to Yguazu substation
- Appointment of FEED and EPC contractor with main sub-packages to be identified and to be tendered
- Leveraging on learning curves following 120MW project to accelerate 300MW project



Itaipu Dam

FIRST EVER HYDROGEN PRODUCTION IN PARAGUAY IN 2023

PARAGUAY NEEDS CLEAN FUEL

- No active railways –dependent on long-haul trucking and other heavy transport including barges
- Imported fuels such as diesel and gasoline cost Paraguay US\$1.3 billion per year
- Sales of fuel cell vehicles grew by about 65% from 2020 to 2021, with total sales of about 17,000 vehicles (up from 11,000 in 2020). Commercial vehicles account for about 10% of total vehicle sales, with about three-quarters consisting of fuel cell buses and the remainder of trucks [1]

ATOME MOBILITY



Green hydrogen for the heavy transport sector and establish an early presence in LatAm



First electrolyser (1MW) expected to start producing income generating green hydrogen by end H2 2023



First hydrogen cars on road in Paraguay expected by end 2023



In advanced discussions with equipment suppliers and vehicle manufacturers



Access to dual fuel technology to retrofit existing heavy transport



CPH2 electrolyser container



Arenal Volcano, Costa Rica

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GREEN HYDROGEN & AMMONIA PRODUCTION

COSTA RICA | JOINT VENTURE

GREEN AMMONIA PRODUCTION FOR CENTRAL AMERICA

NATIONAL AMMONIA CORPORATION



ATOME entered into a joint venture with Cavendish, the renewable energy arm of one of the largest corporations in Costa Rica, the Purdy Group, targeting over 100MW of projects



The National Ammonia Corporation S.A ("NAC") has a mandate to develop green projects across Central America and the Caribbean with its initial focus in Costa Rica itself



NAC objectives follow ATOME's strategy to focus on countries with renewable power resources and a significant agricultural domestic market for fertilisers where we can develop projects that will have a significant local impact as well as reach international markets

COUNTRY PROFILE

ECONOMY

Democratic and open economy. One of the greenest countries in the world with a strong agriculture sector which is one of the highest fertiliser consumers per hectare on the planet

POWER GRID

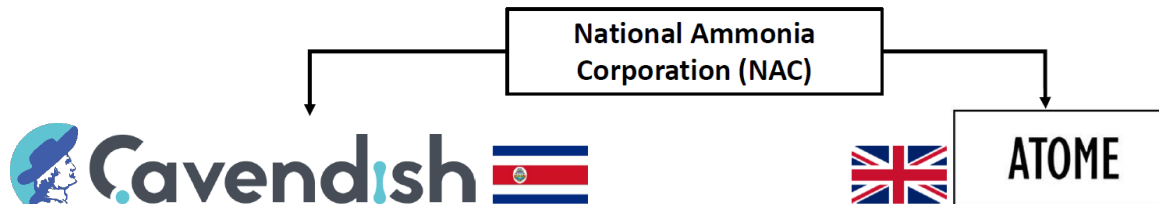
99% penetration of renewable electricity

LOCATION

Favourable position with ports on both the Atlantic and Pacific make the country a logistically excellent location

IMPORTS

100% dependent on the imports of fertilisers. Total fertiliser imports in 2021 were US\$180m. The country's fertiliser consumption is 4.5 times that of the world average.





Green Fuel potential production facility site at Bakki, Iceland

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ICELAND | PROJECT

ICELAND | Supplying the European Market

Almost all electricity in Iceland is produced using renewables – 73% from hydropower and just under 27% from geothermal energy

Iceland's climate commitments and Hydrogen roadmap stresses the importance of reducing fossil fuel use in transport and shipping, e.g. new registrations of fossil fuel cars will be banned after 2030

Iceland has a significant shipping and fishing industry which is under pressure from the IMO to decarbonise its operations. Iceland's maritime sector also has a large presence relating to land transport (trucks, HGVs) in the country



CHALLENGE

Maritime transport emits 940 million MT of CO₂ annually, equating to 2.5% of global GHG emissions

- The investment needed to meet the International Maritime Organisation's climate target (50% reduction in emissions by 2050) is \$US1.4-1.9 trillion, an average of \$40-\$60 billion annually over the next 20 years (Oxford Energy Forum, 2021)
- In 2021, the World Bank estimates a US\$1 trillion market opportunity from the decarbonisation of shipping (World Bank, 2021)

SOLUTION

By 2050, ammonia could make up 25% of all maritime fuel, with all new ships from 2044 running on ammonia (Ammonia Energy Association, 2019)

ICELAND - KEY FACTS

| | |
|--------------------|---|
| Corporate Tax Rate | 20% |
| GDP | US\$ 21.7 billion |
| Energy Policy | Reduce reliance on fossil fuels for transport and shipping sectors |
| Maritime industry | 25 to 30 percent of the country's GDP and 15 to 20 percent of its employment. |
| Oil imports | \$304 million (2020) |



Comparison of shipping fuel characteristics

| | Marine gas oil | LNG | Methanol | Green Ammonia | Green H ₂ |
|---|--------------------------|--------------------------|-------------------|-------------------|----------------------|
| Type | Fossil fuel, high carbon | Fossil fuel, high carbon | Low-carbon | Zero GHG emitting | Zero GHG emitting |
| Temperature for liquid storage | Ambient | -162°C | Ambient | -34°C | -253°C |
| Tank volume for 1,000 nautical mile range | 73m ³ | 164m ³ | 169m ³ | 299m ³ | 555m ³ |
| Suitable application | Short and long | Short and long | Short and long | Short and long | Short |

ICELAND | Towards Production

01



ATOME has a 75% interest in Green Fuel ehf, an Icelandic based green hydrogen and ammonia company, managed by experienced local management who own the other 25%

02



MOU to secure up to 100MW of power, with support from Ministry of Industry; the local municipality

03



Part of the Schengen Zone and in close proximity to Europe to develop an export market, projected to benefit from EU's increasing number of green energy grants and subsidies

04



MOU with Haldor Topsoe, for the development of commercial and tech solutions for Green Fuel's project for SOEC technology

05



Letters of Support for offtake in place with: Green Energy Park near Bremen, Germany and The city and port of Groningen, The Netherlands

06



Positive discussions with the Icelandic government, power suppliers and offtakers with a government-backed grant secured of US\$175,000





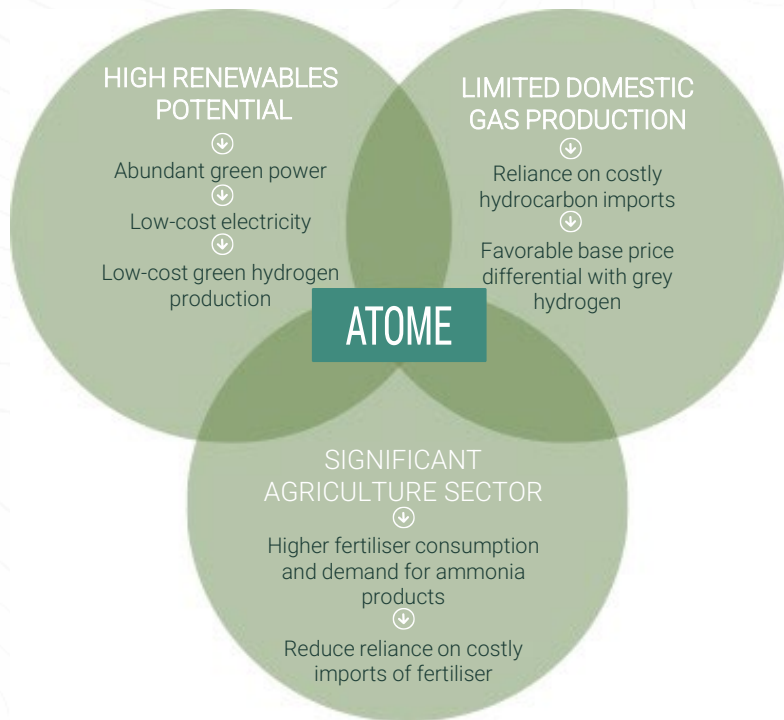
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SCALING UP

ATOME | Growth Strategy

ATOME intends to build a pipeline of assets in geographies where a mix of conditions allows to produce green hydrogen at a low-cost with strong domestic demand



KEY CONSIDERATIONS



1. Partnership with local, well-connected and experienced partners to lead negotiations and operations on the ground
 - Familiar to local energy market
 - Local trust and relationships are key
 - Access to skilled local labor
2. Access to low-cost power and existing infrastructure:
 - Reduces significant capex
 - Shortens time for build out of infrastructure and reduce project risk
 - Enables fast track production of scalable H₂>NH₃ projects to build up from a reasonable project size vs. GW sized long term projects
3. Strong local demand with access to the wider, scalable regional market, leveraging leading energy and fertiliser offtaker/traders in each market
4. Stable countries with favorable fiscal regimes with clear decarbonisation and hydrogen strategies
5. Existing brownfield "grey" fertiliser facilities with potential for green hydrogen/ammonia trains

ATOME | Outlook

| ATOME Projected Timeline | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|--|------|------|------|------|------|------|
| ATOME admission to London Stock Exchange | ✓ | | | | | |
| MOBILITY | | | | | | |
| Mobility Division Created | | ✓ | | | | |
| First electrolyser ordered | | ✓ | | | | |
| First revenue for Mobility Division | | | → | | | |
| Mobility Division expansion | | | → | → | → | → |
| VILLETA | | | | | | |
| Binding PPA for new Villeta Project signed | | ✓ | | | | |
| AECOM appointed as Owners Engineer | | ✓ | | | | |
| Land acquired for Villeta | | ✓ | | | | |
| FEED contractors appointment | | ✓ | | | | |
| PPA extended to 120MW | | ✓ | | | | |
| FID expected for Villeta (120MW) | | | H2 | | | |
| Villeta build out | | | → | → | → | |
| Villeta commencing production | | | | | → | → |
| YGUAZU | | | | | | |
| Yguazu 300MW PPA | | | → | | | |
| FID expected 300MW Yguazu | | | → | → | | |
| Yguazu build out | | | | → | → | → |
| Yguazu commencing production | | | | | | → |
| ICELAND / COSTA RICA | | | | | | |
| Green Fuel ehf acquired | ✓ | | | | | |
| National Ammonia Corporation formed | | | ✓ | | | |
| Securing PPA | | | → | → | | |
| FEED | | | | → | → | |
| FID | | | | | → | → |

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